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MINI-FOCUS ISSUE: PROCEDURAL COMPLICATIONS

INTERMEDIATE

IMAGING VIGNETTE: CLINICAL VIGNETTE

Intramural Hematoma During a Complex Chronic Total Occlusion Intervention

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ABSTRACT

We describe a patient who presented for elective percutaneous coronary intervention to treat a chronic total occlusion of the right coronary artery. An intramural hematoma resulted from the intervention and was discovered with intravenous ultrasound. The complication was successfully managed conservatively, and follow-up showed patent coronary arteries. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2022;4:732–733) © 2022 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

CASE PRESENTATION

A 79-year-old woman presented with progressively worsening shortness of breath on exertion over 1 year, on a background of hypertension. Physical examination revealed grade 3 to 6 systolic murmurs at the mitral and tricuspid areas. Investigations showed sinus bradycardia at 52 beats/min, blood pressure of 130/85 mm Hg, and a positive stress test result. A transthoracic echocardiogram revealed mild to moderate mitral regurgitation, moderate tricuspid regurgitation, pulmonary hypertension with right ventricular systolic pressure of 60 mm Hg, and a left ventricular ejection fraction of 65%. Diagnostic angiography revealed single-vessel coronary artery disease with a chronic total occlusion (CTO) of the right coronary artery (RCA), as well as mainly ipsilateral collateralization with some contralateral collateralization from the left coronary system (**Figures 1A and 1B**). The heart team agreed that percutaneous coronary intervention (PCI) on the RCA CTO was indicated.

PCI using intravascular ultrasound (IVUS) was performed. Dual injections were performed from the right femoral artery and the right radial artery.

A 7-F catheter was used together with a Corsair Pro XS microcatheter (Asahi Intecc) and silicone-coated guidewire. The guidewire was exchanged for another wire with a tapered tip, which did not progress. Therefore, we upgraded to a polycoated moderate stiff guidewire without a tapered tip. This guidewire successfully progressed through the distal cap into the true lumen. Attempting to rewire the polycoated moderate stiff guidewire, we lost position but eventually rewired the distal vessel. We then brought the microcatheter down and exchanged the moderate stiff guidewire for a silicone-coated guidewire. Pre-dilation of the lesion was conducted with increasing sizes of semicompliant balloons starting at 1.25 × 15 mm up to 3.0 × 20 mm. An IVUS pullback revealed a long segment of intramural hematoma extending from the mid-RCA to the distal RCA (Video 1A). We stented the mid-RCA with a 3.5 × 22 mm sirolimus DES and the distal RCA with two 3.0 × 30 mm DES. This maneuver moved the intramural hematoma distally to the crux cordis and the posterior descending

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artery of the RCA; we stopped stent implantation. IVUS showed persistence of the hematoma behind the implanted stents (Video 1B). The patient remained stable and pain free throughout the procedure.

Management was conservative in the intensive care unit for 24 hours. A repeat coronary angiogram 2 months later showed minor nonobstructive coronary artery disease and a 20% stenosis after the origin of the first diagonal branch (Video 2). She was treated with medical management and risk factor modification.

Coronary artery disease can be visualized with multiple imaging modalities. In this case, we describe an intramural hematoma after multiple guidewire exchanges. IVUS allowed for visualization of the intramural hematoma. This imaging parallels optical coherence tomography (OCT) and angioscopy, with OCT having superior axial and lateral resolution but lower tissue penetration.[1]

ABBREVIATIONS AND ACRONYMS

CTO = chronic total occlusion

DES = drug-eluting stent

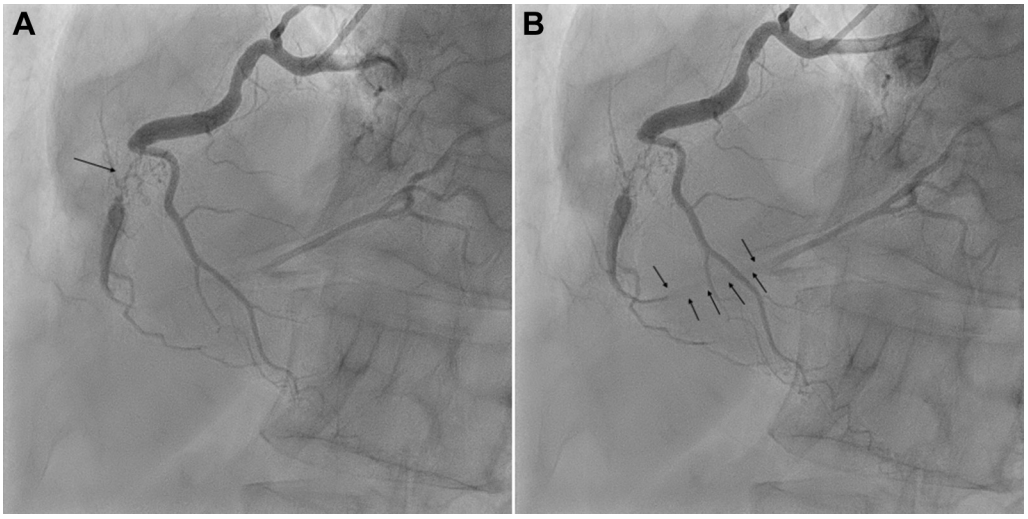
IVUS = intravascular ultrasound

OCT = optical coherence tomography

PCI = percutaneous coronary intervention

RCA = right coronary artery

FIGURE 1 Diagnostic Coronary Angiogram



Imaging revealed **(A)** total occlusion of the distal right coronary artery **(arrow)** and **(B)** collateral flow from the left and right coronary artery system to the distal right coronary artery **(arrows).**

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KEY WORDS complication, coronary vessel anomaly, intravascular ultrasound, percutaneous coronary intervention

APPENDIX For supplemental videos, please see the online version of this article.